

Earth Science Division's Applied Sciences Program DEVELOP National Program

The DEVELOPer Spring 2013 Newsletter

Landsat 8 Launch »

With the ignition of an Atlas-V rocket on February 11, 2013, the next step was taken in one of our nation's most successful and important scientific endeavors: Landsat.



image credit: Kim Shiflett/NASA

Landsat Carries On

As a cornerstone of NASA's Earth Observing System and bellwether for space-based Earth remote sensing, the Landsat program has played a vital role in society's pursuit of scientific discovery. Landsat's over 40 years' of historical Earth observation data are invaluable to understanding our changing planet.

The Landsat Data Continuity Mission (LDCM), which will be officially named Landsat 8 in late May 2013, builds upon the longest continuous record of the Earth's surface as observed from space, advancing Landsat's niche as the 'ever-observing eye in the sky' measuring and tracking all of the seen and unseen phenomenon that make our planet dynamic. Landsat 8's success will be imperative in continuing to provide data indispensable to furthering our understanding of the environment and the monitoring of Earth's surface.

A World Without Landsat

With nearly a half century of Earth observation data collected under the Landsat program's belt, those data have been instrumental in a wealth of innovative scientific work that has shaped the way

we view and live in our world. In a world without Landsat:

- ▶ Millions of people would be without timely early warning concerning emerging and evolving food security concerns (Famine Early Warning Systems Network, FEWS NET)
- ▶ Decision-makers during the first Gulf War would have been without the imagery that helped them locate the nearly 600 oil wells set afire during the withdraw of Iraqi troops from Kuwait
- ▶ Essential measurements and dramatic imagery of humans' impact on our environment such as the shrinking Aral Sea

If any of the now eight Landsat missions had been lost to budget oversight or scientific disinterest, then our planet would be a much less understood and observed place.

Landsat's Future

The substantial outcomes of the Landsat program, set in motion with the 1972 launch of Landsat 1, seem poised to remain relevant into coming decades as humans continue to utilize the unique vantage point of space to peer back at our Earth. <<<



HQ Corner »

To the DEVELOP national teams:

It is my pleasure to send you all a quick word from NASA HQ and offer a thought or two on the key connections the Applied Sciences' Disasters Program has with the great work I have seen so far from our DEVELOP team members. One aspect of our NASA disaster portfolio of projects reflects a need to work within those areas of the disaster management cycle (alert, response, recovery and mitigation) where NASA data, tools and expertise are in particular valuable to a broad range of end users, including emergency management. What I have been working to bring to our collective disaster work and investments at NASA is an ability to expand, apply and adapt successful demonstrations of new capabilities, data streams, or novel tools beyond their initial scope in geography (regional to global) or disaster type. I am in particular excited by the DEVELOP work in that many of these projects have aspects of this cross-fertilization nimbleness where we can realize greater gains across other existing and wholly new disaster activities. Moreover, I am also looking for the means to further the work of future DEVELOP teams within the context of the numerous international projects NASA is leading or is actively involved in. The world of Earth observation is trending toward the greater use of data and assets from other space agencies to fully cover our needs in disaster management. Great to speak with you and look forward to hearing from all the DEVELOP teams of their thoughts and insights!



Best, F.

Frank Lindsay, Ph.D.
Disasters Program Manager

Science Advisor Highlight: Dr. Kenton Ross »

Dr. Kenton Ross has been DEVELOP's National Science Advisor for about a year now, but how much do you know about him?

Dr. Kenton Ross has been advising DEVELOPers in some form or fashion since 2006. With a Ph.D. in Agronomy from Purdue University, M.S. in Civil Engineering also from Purdue, and B.S. from Wheaton University in Physics, he began working at Stennis Space Center in 2002 where he served as a Research Science Associate Manager, Senior Systems Engineer and participated in the Space Shuttle Columbia recovery effort. Dr. Ross provided ad hoc advising for teams at Stennis Space Center until early 2007 when he officially became the lead science advisor to the Stennis team. During his time as the lead advisor at Stennis he oversaw over 100 interns working on 15 project teams, playing a pivotal part in the growth of the Stennis node, as well as in the personal and professional development of the many interns.

As a contractor with Science Systems and Applications, Inc. (SSAI), he left Stennis in 2010 and went to work on the SSAI contract with NOAA NESDIS Environmental Satellite Processing Center (ESPC) Satellite Product Services Division & Satellite Analysis Branch in Maryland. While at NOAA he continued to serve as a volunteer advisor to DEVELOP projects in his spare time. In early 2012, Dr. Ross joined the DEVELOP National Program Office (NPO) as the chief science advisor and now leads the collective of advisors and mentors, as well as ensures the scientific merit and innovation of DEVELOP projects.

This spring, Dr. Ross transitioned to a NASA civil servant position at Langley Research Center. As the DEVELOP National Science Advisor, it is his job to guarantee the quality of science which engages DEVELOPers and delivers solutions to our end users. He does this through proposal input and review, through encouragement of innovative tools, methods and data sources, and through coordination among team and project science advisors across DEVELOP.

Looking ahead, Dr. Ross has quite a few initiatives that he is leading. He would like to see an increase in the number of



peer-reviewed publications, increase the tools and tutorial materials that project teams have to use in their work with new sensors like Suomi NPP VIIRS and with temporal analysis, engage with other internship, volunteer and extramural organizations to increase knowledge transfer to our partners, and broaden and extend opportunities for DEVELOPers to take projects forward into thesis research and improve end-user outcomes.

As DEVELOP National Science Advisor, Dr. Ross is always willing to help interns with any of their science concerns. He is an invaluable resource to have on our DEVELOP team! If you ever have a question and don't know who to ask, ask Dr. Ross! ◀◀◀

Project Partner Story »

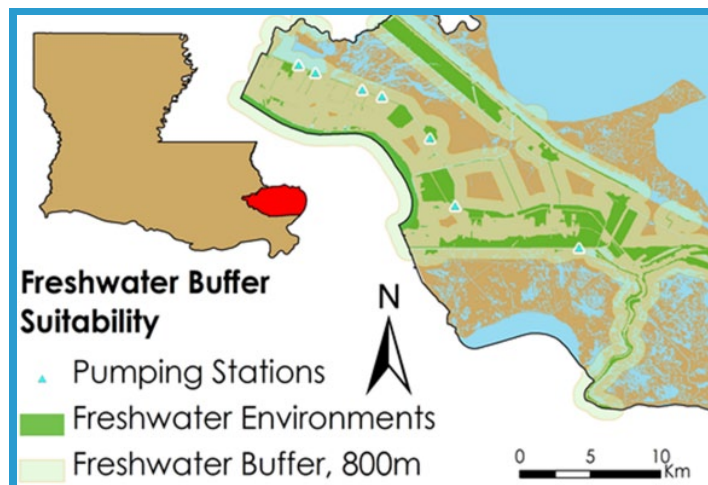
DEVELOP projects not only highlight the capability of NASA satellite and airborne remote sensing technology, but do so in order to enhance the decision making process of partner organizations. Therefore, the project partners serve as an important component in DEVELOP research and largely determine the overall success of applying the results found in projects to the real world.

In summer 2012, the Stennis Space Center (SSC) Louisiana Eco Forecasting team partnered with the St. Bernard Wetlands Foundation, Wetlands Tree Foundation, Louisiana State University Agricultural Center, St. Bernard Parish Planning Commission and Meraux Foundation to address the loss of coastal forests, which not only increased the vulnerability of human populations to storm impacts, but also decreased the amount of biodiversity in St. Bernard Parish, through the conversion of swamp and marshland to open water. The condition of Gulf Coast Wetlands is a relevant concern for all citizens. Rebecca Livaudais, a project partner from St. Bernard Wetlands Foundation, said, "Everyone needs to spread the word that Louisiana's wetlands are really America's wetlands."

Focusing their attention on losses of bald cypress and cypress-tupelo swamp forests in Bernard Parish, the SSC Gulf Coast Eco Forecasting team was able to monitor and delineate suitable planting sites for the bottomland hardwood trees. Using high resolution imagery and comprehensive GIS analysis, the team produced a land-cover classification map and a map identifying areas of most suitable soil ratings and elevations. These maps were given to the St. Bernard Wetlands Foundation, Wetlands Tree Foundation, Louisiana State University Agricultural Center, St. Bernard Parish Planning Commission, and Meraux Foundation to be put into immediate use.

Blaise Pezold, a project partner from the Wetland Tree Foundation, said, "Our current strategy for the 2013 planting season is completely derived from the DEVELOP maps, which should give our groups a clearer understanding of the goals for reforesting the Central Wetlands. We hope to petition the Coastal Zone Manager to adopt these maps in the Parish's Master Plan." When Ross Reahard, DEVELOP Stennis Center Lead, was asked about the project he said, "This project not only highlighted the robust capabilities of NASA EOS to aid in the restoration of coastal ecosystems, but also helped form a solid and lasting partnership with several NGOs and other groups interested in reforesting St. Bernard Parish and the surrounding region."

The maps are now used to guide coastal restoration efforts and will continue to in the foreseeable future. Congratulations to the SSC Louisiana Eco Forecasting Team! <<<



Virtual Poster Session- Fall 2012 »

The Virtual Poster Session can be the most challenging aspect of the DEVELOP internship, forcing interns to step outside of their comfort zones as they use a unique video approach to present their research to a global audience. Here, we take time to interview the fall 2012 Virtual Poster Winner's team lead, Binita KC, to better understand how such platforms can be advantageous to the project's life cycle.

What was the most challenging part of the project?

Binita KC: The most challenging part of this project was collecting datasets, especially socioeconomic data from Nepal and other ancillary data such as flood maps and historical station datasets. The time zone difference between Nepal and US time was beneficial in one way as we could get our job done overnight. On the other hand, we had meetings at odd hours which made it difficult to involve all the team members from Nepal and US at the same time.

What role did social media play in your project lifecycle?

Binita KC: Social media played a significant role in our project. We were able to bring community concerns and science together. Social media helped us to spread our message to large public domain and helped us to reach scientific community in Nepal and the United States. The valuable feedback we received helped us to improve different aspects of this project. We were approached by other agencies interested in climate change study in Nepal.

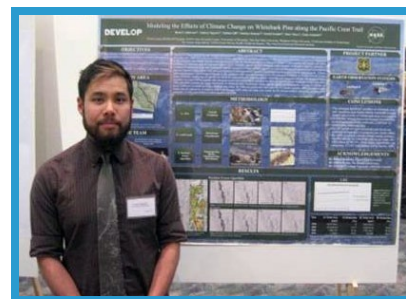
What unique aspects of showing your project through video do you find most useful?

Binita KC: The most exciting part of our video was the interaction with public. We were able to bring forth public concerns through direct interaction which provided a strong background for our study. Apart from this, the video was able to highlight partnership between NASA DEVELOP, SERVIR and ICIMOD, Nepal.

Center Highlights

Ames

- Three former DEVELOP students, Katie Pitts, Ari Wilfley, and Matthew Little, received the Group Achievement Award for their role in the Ames CASI (Climate Adaptation Science Investigator) project!
- DEVELOP Andrew Nguyen attended the Southern Sierra Adaptation Workshop to present the CA Eco Forecasting project to the team's partner, the U.S. Forest Service.
- Former DEVELOP student Ryan Anderson presented for the CA Eco Forecasting team at the American Association of Geographers Great Plains/Rocky Mountain Region Meeting and won first place for best student presentation.



Fort Collins Science Center (FCSC)

- Due to the hard work and substantial outcomes of DEVELOP Fort Collins thus far, in the early spring of 2013, Colorado State University and the USGS Fort Collins North Central Climate Science Center offered additional work space to DEVELOP to expand their efforts.
- DEVELOP Fort Collins team members and science advisors attended the Cache La Poudre (CLP) Research Retreat and presented on their work and the DEVELOP program to various university, state and federal agencies, non-profit organizations and private citizens.
- As an outcome of the Cache La Poudre Research Retreat, the DEVELOP Fort Collins Colorado Water Resources team are now collaborating with the USDA Forest Service, City of Fort Collins, and the non-profit organization Save the Poudre.

Goddard Space Flight Center (GSFC)

- The DEVELOP GSFC West Africa Disasters team continued work in partnership with the Forest Research Institute of Ghana to create an interactive web map to display recent forest disturbances in Ghana.
- DEVELOP GSFC's Florida Eco Forecasting team leveraged partner and advisor resources to accomplish critical fieldwork to measure mangrove biomass and classify mangrove and salt marsh species in order to validate their satellite imagery in preparation for partner handoff. The team would like to thank both the Smithsonian Environmental Research Center and Dr. Temilola Fatoyinbo for making this effort a success.
- The Florida Eco Forecasting team was selected to give an oral presentation in a special session ("Climate Change and the Coastal Environment") at the ASPRS 2013 Annual Conference.

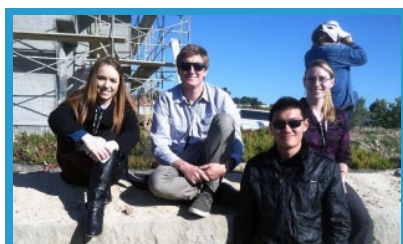
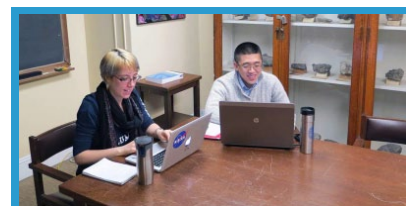


Great Lakes and St. Lawrence Cities Initiative (GLSLCI)

- DEVELOP GLSLCI participated in the Langley Management Walk-Around and presented to Steve Jurczyk, Deputy Director of LaRC.
- The team held a teleconference with project partners Dave Ullrich (Executive Director, GLSLCI) and Pam Kaput Carey (Program Assistant, GLSLCI) to update them on the status of the project and receive guidance on future project paths.
- The team briefed Dr. Jack Kaye and Mr. Lawrence Friedl of NASA Headquarters about project accomplishments on 13 March 2013.

International Research Institute for Climate and Society

- Spring 2013 was the opening term for DEVELOP IRI. Congrats, and welcome to the DEVELOP family, IRI!
- The DEVELOP IRI team met with the National Coordinator of the Center for Health and Development in Ethiopia (CNHDE) in order to better understand the needs of the East Shewa, Ethiopia community.

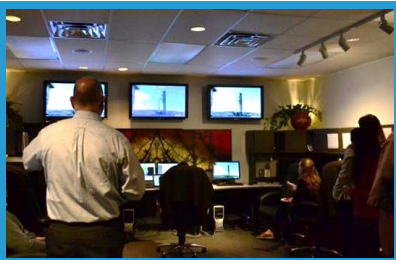
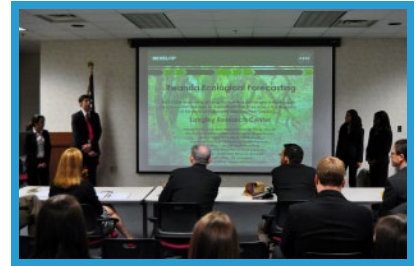


Jet Propulsion Laboratory (JPL)

- The Spring 2013 DEVELOP JPL team traveled to Vandenberg Air Force Base on February 11th, to see the LDCM launch in person!
- DEVELOP JPL Center Lead Austin Madson participated in the 2nd annual Ignite@AGU during AGU's Fall Meeting and gave his talk on the use of and need for RADAR remote sensing in applied research.
- The Sacramento Disasters team presented two terms worth of results to their partner California Department of Water Resources.

Langley Research Center (LaRC) //

- ▶ DEVELOP LaRC supported and presented five posters at the LaRC Science Directorate/SSAI Breakfast and Poster Session on Tuesday, March 5.
- ▶ DEVELOP LaRC presented on the program and Virginia-specific projects during two science briefings to Virginia congressional staff and one update to NASA Headquarters representatives from the Earth Science Division.
- ▶ Representatives from DEVELOP LaRC participated in NASA Langley's AeroSpace Day in Richmond, which led to meetings with the Secretaries of Agriculture and Natural Resources to discuss future project ideas of importance to Virginia.



Marshall Space Flight Center (MSFC) //

- ▶ Team Lead James Brenton gave an oral presentation of the Fall 2012 DEVELOP Colombia Disasters project at the 2012 American Geophysical Union (AGU) Fall Meeting.
- ▶ The MSFC Nepal Eco Forecasting Team celebrated their first win in the Virtual Poster Session hosted by Earthzine after the Fall 2012 DEVELOP term.
- ▶ Capt. Mark Lyles, Ph.D. (U.S. Naval War College) visited the DEVELOP MSFC team on 6 February 2013. Dr. Lyles was a project partner and mentor to the 2012 MSFC Middle East Public Health Team.

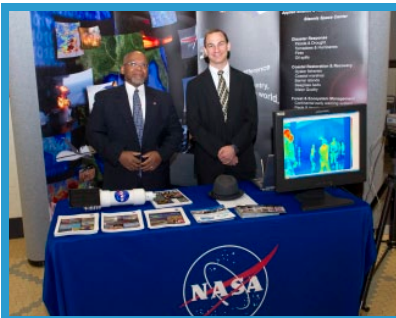
Mobile County Health Department (MCHD) //

- ▶ After numerous hurdles, the DEVELOP MCHD team successfully ran and gathered results from the SLEUTH Urban Growth Model that will be critical to partner's urban planning needs around new infrastructure in Mobile County.
- ▶ DEVELOP MCHD visited Stennis Space Center where along with meetings with the DEVELOP SSC team and science advisor, they also toured the test facilities and National Data Buoy Center.
- ▶ The team began a new tradition of weekly team building activities with "Tuesday Trivia."



St. Louis University //

- ▶ The DEVELOP SLU team has been utilizing high-resolution NASA reanalysis model data for the New England Weather project.
- ▶ This term SLU began work on a second project, Wabash Valley Disasters, that focuses on using SAR data to monitor and measure ground deformations related to strain in the Wabash Seismic Zone.



Stennis Space Center (SSC) //

- ▶ During this spring, over 4500 trees are being planted by DEVELOP partner organizations in St. Bernard Parish, LA. The strategic planning and decision making of tree planting locations utilized research results and methodologies created by DEVELOP SSC.
- ▶ DEVELOP SSC's Jason Jones had a paper accepted into the peer reviewed journal The Geographical Bulletin. The paper is titled "Nonpoint Source Pollution Risk Mapping for Alabama's Big Creek Lake", and should be published in the May 2013 edition of the journal.
- ▶ DEVELOP SSC was nominated and awarded 2nd place for the prestigious EPA Gulf Guardian Award in the area of partnerships.

Wise County //

- ▶ DEVELOP Wise hosted the Rwanda Ambassador James Kimonyo and colleagues. Ambassador Kimonyo visited the DEVELOP office in Wise, VA, where the team's presented their work to him, discussed potential future Rwanda projects and he talked with local college leaders about educational opportunities for Rwandan students in Virginia.
- ▶ The DEVELOP Wise visited and presented research results at NOAA's National Climatic Data Center (NCDC) in Asheville, NC. The team met with NCDC scientists, engineers, and managers to brainstorm ideas for future climate and weather application projects.
- ▶ DEVELOP Wise and Mexico team members presented project outcomes to end-user INEGI (Instituto Nacional de Estadística y Geografía).

NPO Highlights >>

- ▶ The 2013 DEVELOP Strategic Planning and Leadership Retreat took place Jan 8-11, providing the program with a robust path forward and goals for the year.
- ▶ The first round of the DEVELOP Alumni Survey was disseminated and marks the beginning of an exciting opportunity to fully understand the impacts the program has had over its 15 years of business.
- ▶ DEVELOP launched its newest addition to social media with a Pinterest account featuring imagery from all the nodes and projects. Check it out!



Rwandan Ambassador Visit »

The Ambassador of the Republic of Rwanda to the United States, Engineer James Kimonyo, visited with NASA DEVELOP students at the Wise County location on Feb. 27 to explore opportunities for Rwandan students to learn about science and technology. The NASA DEVELOP Wise location currently collaborates with the NASA DEVELOP Langley Research Center on the Rwanda Agriculture and Eco Forecasting project, which aims to enhance the decision making process and initiatives used by the government of Rwanda to conserve agriculture and forestry. When asked about the overall research experience, team member Faith Mwiza said, "We participated in the Rwanda Ecological Forecasting project which will benefit Rwanda by promoting the biodiversity and the forestry conservation efforts currently in place by the government of Rwanda." The Rwanda Agriculture and Rwanda Eco Forecasting teams consist of two students that graduated from Oklahoma Christian University and California Baptist University, who are also from Rwanda.

While visiting Wise County, VA, the Ambassador signed a letter of intent to explore opportunities in working with the Wise County Clerk of Courts Office. "Having the Ambassador in Wise was very exciting. We strive to continue working with the country of Rwanda to assist them in their decision making processes. We also had the opportunity to interact and exchange ideas as well as show what we work on in the NASA DEVELOP Wise Office," Yanina Colberg & Giovanni Colberg (Wise Center Leads). <<<

New Nodes »

In the fall of 2012, DEVELOP established a node in Kathmandu, Nepal, at the International Centre for Integrated Mountain Development (ICIMOD). SERVIR, DEVELOP's fellow-Capacity Building element made this new node a possibility by collaborating with DEVELOP to host the interns while DEVELOP provides project management. The new ICIMOD node began work on a Nepal Climate project that investigated the use of NASA EOS to construct a means of assessing socioeconomic and biophysical vulnerability across Nepal. In the summer the team will focus their attention on using NASA EOS to address ecological forecasting concerns in Bangladesh related to the assessment and sustainable management of natural resources.

This spring our newest node opened in Palisades, NY at the International Research Institute for Climate and Society (IRI). Two new DEVELOPers Caitlin Reid and Sunny Ng are working there on two projects Ethiopia Health and Uruguay Agriculture, respectively. The Ethiopia Health project is focusing on the use of NASA EOS to compare climatic conditions with malaria incidences for improved malaria mitigation, and the Uruguay Agriculture project is using NASA EOS to identify early stages of specific crops for improved yield forecasting to assist with agricultural monitoring in the country. Welcome both Sunny and Caitlin!

Looking ahead to the summer term, DEVELOP will be opening its newest node at the University of Georgia (UGA) under the guidance of Dr. Marshall Shepherd, Dr. Marguerite Madden, and Dr. Deepak Mishra. DEVELOP alumni Steve Padgett-Vasquez, a PhD candidate at UGA, will serve as the Center Lead and oversee multiple teams there this summer. DEVELOP looks forward to the collaboration with UGA! <<<

DEVELOPer of the Term



Winner: Amy Birtwistle

Fort Collins Science Center

Amy is a second-term DEVELOPer at the Fort Collins Science Center and a Master's student in Watershed Science at Colorado State University. In the midst of moving to a new town, and applying to graduate school, Amy enthusiastically dove into her first term with the NASA DEVELOP program during the Fall 2012 term, learning new and complex modeling processes and spearheading critical deliverables with strong results. Amy proved to be an asset to the Colorado Ecological Forecasting team and continues to be an exceptional member of the the NASA DEVELOP family.



Runner Up: James Brenton

Marshall Space Flight Center

James Brenton has worked with DEVELOP since the spring of 2012. Since his first term with DEVELOP he has played a vital role in the overall project success. During the spring of 2012 he worked on the Alabama Disasters Team, contributing to much of the data processing required to analyze crop health post-April 27th tornado event that struck North Alabama. He also wrote a Python code to expedite the data processing in the group's methodology. During the summer and fall of 2012, James was the team lead of the Colombia Disasters project. He successfully led a team consisting of students in Colombia and students here in the U.S.. This term James is contributing his efforts as a team member to the Nepal Climate team.



Runner Up: Ryan Boarman

Jet Propulsion Laboratory

Ryan has proven to be an excellent DEVELOPer, both this term as well as the recent Fall 2012 term. He is an exceptionally fast learner, and excels at many aspects of the DEVELOP program. He has a knack for finding his "niche" within a team, and performing those duties exceptionally well.

Also Nominated...

▶ Evan Johnson

Ames Research Center

▶ Chris McKeel

Langley Research Center

▶ Michelle Hogenmiller & Matthew Warbritton

St. Louis University

▶ Marlena Giattina

Mobile County Health Dept.

▶ Rohini Swaminathan

Wise County

▶ Benjamyn Ward

Goddard Space Flight Center

▶ Brandie Mitchell

Stennis Space Center

▶ Sunny Ng & Caitlin Reid

International Research Institute

▶ Lauren Makely

*Great Lakes & St. Lawrence
Cities Initiative*

GISCorps »

DEVELOP recently started looking for innovative ways to enhance the intern experience within the geospatial career field. One way DEVELOP interns may soon be able to get that added GIS/Remote Sensing experience is by volunteering and collaborating with GISCorps. GISCorps is an Urban and Regional Information Systems Association (URISA) program that operates entirely on a volunteer basis with the core of its members being experienced GIS professionals. Any kind of GISCorps volunteering by DEVELOP interns, following DEVELOP, is encouraged whether it relates to DEVELOP work or not.

Collaborations related to DEVELOP work could focus on continuing DEVELOP projects and possible project handoffs to end-users known by GISCorps volunteers. Working with parallel organizations like the GISCorps could then promote mentorship opportunities from teachers and GIS professionals for DEVELOP interns. More information about collaborating with GISCorps will be released during summer 2013.

To learn more about GISCorps visit: giscorps.org <<<

Alumni Survey »

In 2012, the National Program Office met with John Grunsfeld, the Associate Administrator for the Science Mission Directorate, and was tasked with conducting a survey of the DEVELOP alumni. This survey was intended to assess where the alumni were in their respective careers, their continued exposure to Science, Technology, Engineering and Math (STEM) and finally their exposure to, and usage of, NASA EOS.

The survey is currently open, and DEVELOP is in the process of tracking down past interns. While the survey is far from being finished, some preliminary results are available. For instance, 49% of the respondents to date stated that through their work at DEVELOP, they have stayed involved in, or have exposure to Earth remote sensing. Also, over 98% of the respondents stated that DEVELOP has given them skills that have contributed to their professional career.

We are excited to continue gathering data on the role that DEVELOP has played in the lives of it's interns, and finalizing this first survey towards the end of the summer term. We anticipate a full presentation of the results at the Summer Closeout at NASA Headquarters in Washington D.C. Finally, DEVELOP hopes to begin surveying alumni more regularly, to update our data and continue providing a track record for the DEVELOP National Program. <<<

DEVELOP Pinterest Launch »

DEVELOP gladly announces the launch of DEVELOP's Pinterest page. This year, DEVELOP hopes to not only continue its expansion in the realm of social media, but also strategically optimize each social network for the particular audience intended to reach. Some of the benefits of creating a Pinterest page include an 80% female user-base, easy image organization and easy resharing/virality possibilities.

Melissa Oguamanam, DEVELOP Co-Center Lead at Goddard Space Flight Center, said, "Earth science is an extremely visual field. Using Pinterest will allow the DEVELOP program to effectively engage users with science project visualizations that display the quality of a DEVELOP internship." Melissa pitched the idea of the DEVELOP Pinterest page during the DEVELOP Next Big Idea Incubator Talk at the January 2013 Strategic Planning & Leadership Retreat.

DEVELOP currently has seven Pinterest boards dedicated to a wide range of NASA-related imagery, from specific Program related topics like DEVELOP Project Imagery to a broader scale like Everyday at NASA. <<<

Upcoming Activities »

▶ Spring Term Ends	Apr 5
▶ AAG Annual Meeting - Los Angeles, CA	Apr 9-13
▶ CalGIS: 19th Annual CA GIS Conference - Long Beach, CA	Apr 15-17
▶ Summer Term Begins	Jun 3

